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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/615,507    07/13/00    HAYES

C    P-5534-27

EXAMINER
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BAGWELL, M

ART UNIT	PAPER NUMBER
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1711

DATE MAILED:  
06/19/01

2

BAUER & SCHAFFER LLP  
114 OLD COUNTRY ROAD  
MINEOLA NY 11501

IM52/0619

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

**Office Action Summary**

Application No.

09/615,507

Applicant(s)

HAYES, CLAUDE Q.C.

Examiner

Melanie D. Bagwell

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-59 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-59 is/are rejected.
- 7) ☒ Claim(s) 41-59 is/are objected to.
- 8) ☐ Claims \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. § 119**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

**Attachment(s)**

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 18) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 9-16, 29-36, and 41-59 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
3. Claims 9-16 list a series of endothermic agents, including "oxidized polymers, unoxidized polymers, oxidized homopolymers, unoxidized homopolymers of ethylene polymer compounds". It is unclear whether the applicant intends to claim oxidized polymers, unoxidized polymers, etc. of only polyethylene compounds or of any polymer.
4. The term "high molecular weight" in claims 9-16 is a relative term which renders the claim indefinite. The term "high molecular weight hydrocarbon" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. For the purposes of this Office action, it is the examiner's position to treat the term to encompass any hydrocarbon polymer.
5. Additionally, claims 9-16 recite the term "families of materials" in line 19 in line 2 from the bottom of the claims. One of ordinary skill in the art could not easily determine the bounds of the term "families of materials," thus rendering the claims indefinite.
6. The term "high density" in claims 41-59 is a relative term which renders the claim indefinite. The term "high density polymers" is not defined by the claim, the

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specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Furthermore, the claims recite "polymeric, plastic materials well known to those skilled in the art of thermoprotective materials". The specification does not clearly describe what plastic materials are well known to those skilled in the art, thus rendering the claims indefinite.

### ***Claim Objections***

7. Claims 41-59 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The claims seem to encompass all polymeric materials by the inclusion of the term "polymeric, plastic materials well known to those skilled in the art of thermoprotective materials". Since the independent claim 1 is drawn to a composite comprising a polymer, a term including all polymeric materials would fail to further limit the polymer.

### ***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1-59 are rejected under 35 U.S.C. 102(b) as being anticipated by Hayes. Hayes (USPN 5,709,914) is cited in the specification, p. 2 lines 20-23.

10. Hayes discloses a flexible thermal composite comprising an endothermic phase change material embedded within a molding matrix, where preferred matrix materials include synthetic and natural polymers (column 2, lines 34-50; column 3, lines 17-26). Hayes teaches several of the applicant's claimed endothermic materials, including micronized polyethylene waxes, noting also that the endothermic materials may be recycled (column 3, lines 1-7). Furthermore, Hayes teaches the use of perforated or powdered metals suspended in the matrices and also a KEVLAR/endothermic polyethylene composite sandwiched between two sheets of aluminum (column 4, lines 15-18; column 5, lines 34-45). In each of these situations, a thermal conductive material is contacting the thermal control composite.

11. Claims 1-4, 9-10, 13-14, 17-18, 21-24, 29-30, 33-34, 37-38, 41-44, 49, 52-53, and 56-57 are rejected under 35 U.S.C. 102(b) as being anticipated by Tzur.

12. Tzur discloses flexible thermal control composites comprising endothermic hydrated inorganic salt powder and a polymeric binder (example 6). Tzur teaches that some of the materials will undergo a phase change after the melting the inorganic material that could result in the separation of the hydrated salt into an anhydrous salt and its water of hydration (column 15, lines 61-65). The inorganic material undergoes a phase change during heating and cooling, thus indicating a phase change material. Since the unseparated, hydrated inorganic material could be reused, it is thought to be

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recyclable. Examples teach the use of hydrated epsom salts and other claimed inorganic salts while also teaching natural and synthetic rubber binders. For example, neoprene latex polymers are included in several examples (Stage 1, column 9; examples). Tzur also teaches the need for folded metal mesh or woven ceramic cloth as a structural means for the composite, thus providing a thermally conductive material in contact with the composite (column 3, line 65-column 4, line 2; Figure 4).

13. Claims 1-59 are rejected under 35 U.S.C. 102(b) as being anticipated by Buckley.

14. Buckley discloses flexible thermal control composites containing endothermic phase change materials dispersed within a polymer matrix (col. 3 line 65-col. 4 line 1), where Buckley lists several possible polymer natural or synthetic matrix materials (col. 5 lines 21-32). Phase change materials mentioned in the reference include polyethylene glycol and phase change salts, suggesting the use of oxidized polyethylene homopolymers and inorganic salts (col. 13 lines 21-30). The composite may include a conductive material, or the composite may have an adjacent conductive material layer (col. 7 lines 38-55), thus providing contacting thermal conductive materials.

Furthermore, Buckley teaches the phase change materials as being regenerated to the original state, thus suggesting recyclable properties of the materials. Regarding the size of the phase change materials used, Buckley suggests incorporating the materials into microcapsules, indicating the phase change materials are sized to be incorporated into microcapsules. Thus, it is the examiner's position that one skilled in the art would clearly envision the use of micronized phase change materials in the invention.

***Claim Rejections - 35 USC § 103***

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. Claims 5-8, 11-12, 15-16, 19-20, 25-28, 31-32, 35-36, 39-40, 45-48, 50-51, and 54-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tzur.

17. Tzur applies as above, failing to specify the particle sizes (i.e. "micronized") of the inorganic powders used in the invention. However, the term "powder" as used in the reference indicates very small particle diameter. It is the examiner's position that it would have been prima facie obvious to use the inorganic powder having any desired particle size to optimize the thermal properties of the composite.

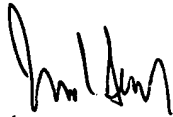
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melanie D. Bagwell whose telephone number is (703) 308-6539. The examiner can normally be reached on M-F 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on (703) 308-2462. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 872-9309.

mdb  
June 15, 2001



James J. Soldo  
Supervisory Patent Examiner  
Technology Center 1700